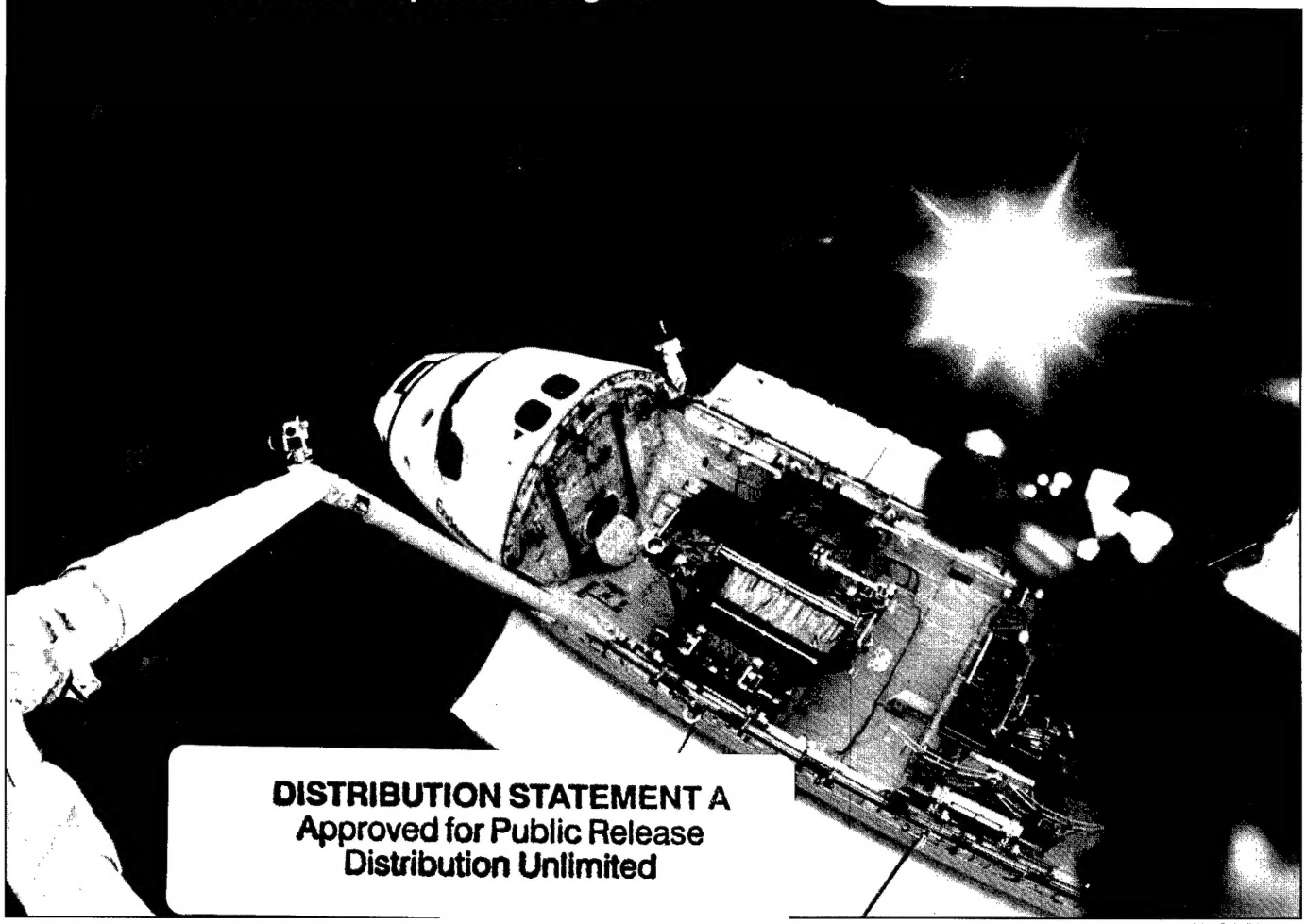
Naval Space Command

SPACE TRACKS

A BULLETIN ON NAVAL SPACE ISSUES AND INITIATIVES March/April 1999

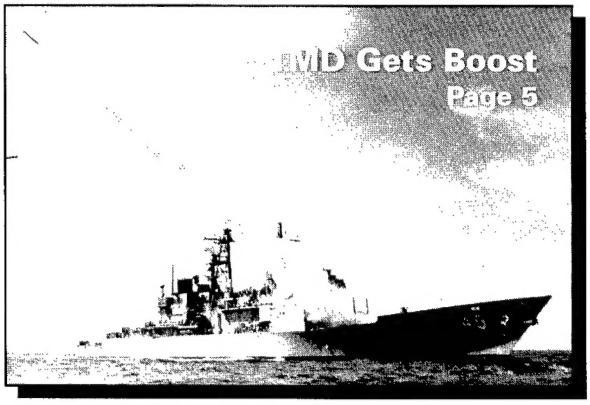
Space Is An Ocean

A Naval Perspective • Page 3



NASA Photo

IN THIS ISSUE ...



NAVSPACECOM DIRECTORY

Naval Space Command provides direct space support to Fleet and Fleet Marine Force operational units around the world, whether for routine deployments, exercises, or actions in response to a crisis situation. We take very seriously our duty of ensuring that our Sailors and Marines understand what products are available from space, how to access them, and how to exploit those products in the waging of war and peace.

○ Operational Status/Exercise Support Summaries

Naval Space Command maintains a home page on the Global Command and Control System (GCCS) accessible to operational U.S. military forces worldwide at http://navspac1.navspace.navy.smil.mil or http://206.36.197.10.

○ Naval Space Operations Center (540) 653-6500

Call Toll-Free at 1-888-404-6557. Source of space-related operational intelligence. Space reports and analyses are activated on request and are tailored to a deploying unit's operations and geographic area of movement. Tactical assessments of space system capabilities and vulnerabilities to potentially hostile space sensors are also available.

○ Naval Space Support (540) 653-6160

Naval Space Support Teams provide tailored information and training at all operational levels to include on-site training, exercise support, and staff augmentation.

○ Remote Earth Sensing Information Center (540) 653-6520

Naval space Command employs imagery from remote Earth sensing satellites to support intelligence, planning, and operations. Our Remote Earth Sensing Information Center (RESIC) — formerly known as the MSI Cell — processes Landsat, SPOT, and Controlled Image Base (CIB) data in support of Fleet and Fleet Marine Force units. Hardcopy and softcopy products, specifically tailored to users' needs, are produced by RESIC and distributed to support forces participating in real-world crisis, operations, and exercises. RESIC products can be produced to support any of the following applications:

Planning
Target Area Analysis
Bathymetry
Order of Battle Disposition
Change Detection
Broad Area Coverage
Intelligence Prep of the Battlefield
Mission Rehearsal
Amphibious Support
Supplement MC&G Products
Trafficability

Product requests can be submitted via GENADMIN message to: COMNAVSPACECOM DAHLGREN VA//N313//, via facsimile to DSN 249-6167 or (540) 653-6167, via email to MSI@manta.nosc.mil, or via Naval Space Command's SIPRNET web page.

○ Internet On-Line Access

Naval Space Command maintains a home page on the World Wide Web at URL http://www.navspace.navy.mil. Comments or requests for information may be forwarded to the Public Affairs Office via email to gwagner@nsc.navy.mil.

NAVAL SPACE COMMAND

COMMANDER
Rear Admiral Thomas E. Zelibor

DEPUTY COMMANDER
Colonel Michael M. Henderson

SPACE TRACKS

EDITOR
Gary R. Wagner

CONTRIBUTORS
Cmdr. Sam J. Tangredi
Lt.Cmdr. Jane Hoffman
Lt.Cmdr. David H. Atchison
JO1 Chris Alves, JO2 Kaye Trammell
IS2 Darin Kroft, Al Sapp, Ed White
Craig Baldwin, Lt. Michael Scott
Douglas J. Gillert, Henry B. Odom
Timothy L. Dolan, Janice Schultz

PRODUCTION
IPI Graphics
Upper Marlboro, Md.

CIRCULATION
B. J. Andersen, Susan Wright;
Administrative Support Branch

SPACE TRACKS is published five times a year as an official, authorized publication of Naval Space Command. Its purpose is to discuss naval space issues and initiatives, and promote a broader awareness of space support available to the naval warfighter. Information contained in Space Tracks does not necessarily reflect the official views of the U.S. Government, the Department of Defense, or the Department of the Navy. The editorial content is prepared by the Public Affairs Office of the Commander, Naval Space Command.

Address all correspondence to Editor, Space Tracks, Naval Space Command (Code 00P), 5280 Fourth St., Dahlgren, Va. 22448-5300; telephone (540) 653-6111, DSN 249-6111, FAX (540) 653-6108. Comments or queries may also be forwarded via email to gwagner@nsc.navy.mil.

COVER PHOTO: *A space-walking astronaut on board Endeavour captured this view of the space shuttle against the blackness of space during mission STS-61 in December 1993.*

PERSPECTIVE

NASA Photo

By Cmdr. Sam J. Tangredi

Space is an ocean — and I'm not speaking metaphorically. Ocean defines both "the entire body of salt water that covers approximately 72 percent of the Earth's surface," and any "great expanse."

Early civilizations believed that the ocean and the stars above were linked inextricably. In the age of exploration, the ocean represented the ultimate unknown whose guideposts were the heavens. Earlier in this century, science fiction writers — our prophets of the medium — referred to the cosmos as "ocean space," whose conquest would inevitably be done by "space ships." Gene Roddenberry, creator of the television series "Star Trek," was right on the money when he made the Starship Enterprise a naval vessel.

For Americans about to enter the next millennium, the coming age of space will be an era of exploitation as well as exploration, and the nation requires a philosophical approach to the use, exploration, and — if need be — defense of space that is best suited for the ocean-like cosmic environment. That philosophy is inherently naval in tone and tradition.

A naval philosophy of space — the application of naval organizations and traditions to the use of space — would permit full integration of efforts from sea and land into the heavens. Under this philosophy, we would think in terms of voyages rather than missions. A team-oriented concept of crew would prevail, not the lone eagle approach that shaped the conquest of the air, but led to organizational schisms.

More important, we would exploit space not as a separate region, but as a continuation of the spectrum of media — from the ocean depths to the heavens above — in which mankind can live and explore for extended periods in a mutually supportive fashion.

As regards defense, requiring a naval tone is not a nuance. Underlying the Navy's efforts to ensure mastery of the seas is the realization that the ultimate purpose of such mastery is to affect directly events on the land. Inherent in the natural jointness of the naval approach shared by the Navy and Marine Corps is the history of integration of forces capable of acting throughout the earthly spectrum of land, sea, and air. Thus it is natural for naval forces to view such wartime missions as close air support as integral to, not separate from, the range of missions conducted by naval air forces.

A naval philosophy toward spacefaring and space defense would ensure that "close space support" would not become an orphaned mission in any battle for the outer reaches. At the same time, the core competencies of the expeditionary naval services could be applied to extended deployments in space during peace and times of potential conflict.

Space is not just an extension of the air. Space is an ocean, and oceans are where navies go.

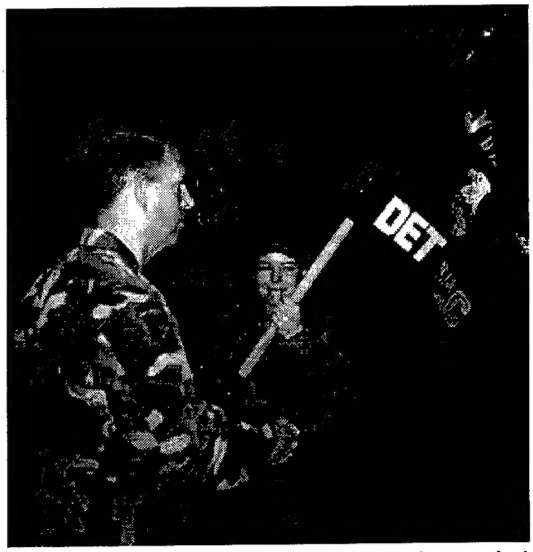
Author Cmdr. Sam J. Tangredi heads the Strategy and Concepts Branch on the staff of the Chief of Naval Operations.

Navy Lt. Wakefield Assumes Command of JTAGS Detachment

By Ed White

This is the best tour I've ever had in the Navy — and the only tour I've had in the Army," said Navy Lt. Sandra Jamshidi as she passed over the reins of command of the Joint Tactical Ground Station-Pacific (JTAGS-PAC) detachment on Dec. 18. Taking up the command was Navy Lt. Tonya Wakefield.

The JTAGS-PAC detachment provides early warning of missile launches to the forces of CINCPAC from Osan Air Force Base in Korea. The detachment is small; only 19 soldiers and Sailors are required to operate the equipment 24 hours a day, seven days a week. Their skill and dedication provide the basis for early warning of missile launches for U.S. and coalition forces in the Pacific Theater.



Lt. Tonya Wakefield holds the guidon, the symbol of command, as she takes charge of JTAGS-PAC at Osan Air Base in Korea.

Lt. Wakefield and the Sailors in the JTAGS-PAC detachment are deployed from NAVSPACECOM's JTAGS Detachment ECHO, homeported at Chesapeake, Va.

Lt. Jamshidi had an unusual assignment being a Navy officer in command of an Army unit stationed on an Air Force base. She praised the strong leadership of the detachment NCOs, whether Army or Navy, and she praised the soldiers and Sailors, the operators of the JTAGS-PAC missile warning equipment. "They spend many long hours of boring watches, but when there is a real TBM out there, they know how to make 10 or 15 seconds count!"

The second best thing about the command according to Jamshidi is "the incredible opportunity to work with so many outstanding people stretching from CINCSPACE to CINCPAC to U.S. Forces Japan, and U.S. Forces Korea, Chief of Naval Forces Korea, and right here to 7th Air Force." She added that the opportunity to contribute to the development of Theater Missile Defense CONOPS (concept of operations) and provide input to the OPLANS in Korea has allowed the small ARSPACE detachment to ensure that the data they provide is understood and disseminated to the necessary operators.

Lt. Wakefield, the new commander, is a highly qualified replacement for Lt. Jamshidi. The two first met as students at the Naval Postgraduate School. Lt. Wakefield did her thesis on TMD, giving her a strong understanding of how the system works and of the communications architecture that JTAGS uses to support the warfighter.

"Tonya knows more about JTAGS and the comms architecture than I did one quarter of the way through this assignment," Lt. Jamshidi said. "You can be assured she's qualified to lead this unit and provide PACOM timely, accurate TMD warning."

Lt. Wakefield said, "Ballistic missile defense is an important mission in theaters where the threat exists. The early warning forces represent not only a vital link, but the very first link in the chain of passive defense of our forces. JTAGS is a team, not just a group of soldiers and Sailors who happen to work together. Their cooperative effort provides a synergy that is vital to mission accomplishment.

"JTAGS-PAC has an outstanding reputation in the TBMD community which I intend to maintain with the help and support of the detachment and all those who support us," she added.

Author Ed White is the public affairs officer for Army Space Command Forward at Colorado Springs, Colo.

Vice Admiral Browne New Deputy CINC for U.S. Space Command

Vice Admiral Herbert A. Browne assumed duties as deputy commander in chief for U.S. Space Command, headquartered at Peterson Air Force Base, Colorado Springs, Colo., in November.

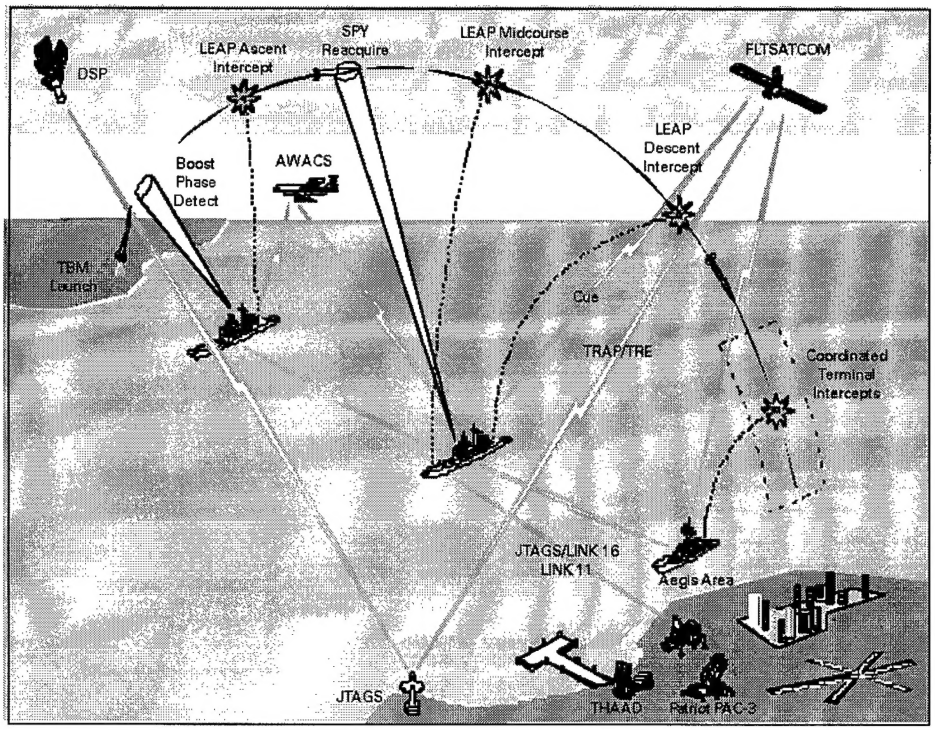
As deputy CINCSPACE, Vice Admiral Browne helps lead the unified command responsible for directing space control and support operations including missile defense.

Originally from McKinney, Texas, Vice Admiral Browne initially enlisted in the Navy in 1964, after completing two years at Texas A&M. Soon after boot camp, he was selected for Naval Flight Officer (NFO) Training. He was designated an NFO and commissioned in March 1966.

Vice Admiral Browne

A career naval aviator, Vice Admiral Browne has served in numerous capacities in Attack Squadrons VA-65 and VA-42, operational billets at sea, and command positions. Prior to assuming his current duties, Vice Admiral Browne served as Commander Third Fleet.

Other assignments have included tours as Commander Naval Space Command, as deputy commander for Joint Task Force-Southwest Asia in Riyadh, Saudi Arabia, as Commander Carrier Group ONE, and as deputy commander in chief for U.S. Pacific Fleet.



DOD Speeds Navy Theater Missile Defense Project

By Douglas J. Gillert

To defend against the growing threat of missile attacks on foreign-based U.S. forces, DOD will accelerate development of a sea-based theater missile defense system.

A perceived medium-range missile threat and past test failures of the Army ground-based Theater High Altitude Area Defense (THAAD) system provoked DOD into moving up the scheduled fielding of the Navy system from 2010 to 2007, according to Air Force Lt. Gen. Lester Lyles, Ballistic Missile Defense Organization (BMDO) director.

DOD will continue funding the Army's THAAD system despite its repeated flight test failures. However, the Pentagon will pit it against the Navy Theater Wide system to determine which of the upper-tier defenses can be deployed first.

"Tier" refers to a strategy of layered U.S. defenses. "Upper-tier" systems would intercept incoming long and medium range missiles during their flight in or above the outer atmosphere. "Lower-tier" systems defend at short to medium ranges against missiles in their late or final flight stages.

"Because of the urgency in fielding an upper-tier system, we are going to continue flight-testing the THAAD interceptor missile and other elements of the system such as the radar," Defense Secretary William S. Cohen said at a Pentagon press conference in January. "Continued flight tests are going to provide data important for the upper-tier systems beyond the THAAD program."

DOD will increase program funding of the Navy Theater Wide system by more than $500 million from fiscal 1999 to fiscal 2001, including funds added to the program by Congress last fall.

The Pentagon will review both systems in late 2000 to assess costs, schedule, technical performance and risk. Then, DOD will determine the lead program. "Our goal is to have the lead system postured to deploy in the year 2007. Depending upon the results of the review, the other system might continue to be developed but at a much slower pace," Cohen said.

The BMDO also will continue developing lower-tier defenses, including the Patriot Advanced Capability 3 (PAC-3) and Navy Area missile systems. PAC-3 and Navy Area are expected to be fielded by early fiscal 2001 and 2003, respectively.

Both upper- and lower-tier systems work in conjunction with space-based sensors — the same sensors that will be used for surveillance and early warning against missiles targeted at the United States. An airborne laser program, funded by the Air Force, adds to the array of defenses DOD wants to field.

"Battle management command, control and communications provides the critical glue that holds all this together," Lt. Gen. Lyles said.

"These lower-tier systems will provide effective defense capabilities against the shorter-range missile threats," Cohen said. "The threat to our forces is already extensive and growing, making it imperative that we field these important upgrades as soon as possible."

The Pentagon also will reallocate $150 million originally slated for the Medium Extended Air Defense System, or MEADS. The restructured MEADS money also could fund development of a mobile, 360-degree fire control radar and a mobile launcher.

"We'll also make sure that we have the right kind of capability to address advanced threats like cruise missiles that the MEADS program was intended to address," Lt. Gen. Lyles said.

"We need to have lower-tier systems. We need to have upper-tier systems, and we need to have multi-platforms on the land, from the sea and also from air," he added. "We need to make sure that all of these systems work together and can be inter-operable. That's formed the heart of our program for theater missile defense.

"What has changed over the last year, however, is the growing urgency of making sure that we have an upper-tier capability to counter the growing medium-range threat," he emphasized. Lt. Gen. Lyles maintained this threat comes from offensive missiles like the North Korean No Dong, Iranian Shihab III and Pakistani Ghari. "We need to make sure that we have the capability to negate those threats." *Source: Navy Wire Service and American Forces Information Service*

SPACE BILLETS

OFFICERS The following is a partial listing of officer billets with space missions, whose incumbents are scheduled to transfer between June 1999 and January 2000. For specific billet information and actual availability dates, contact your detailer.

Billets With Subspecialty Code XX75 (Space Systems - General)

ACTIVITY	TITLE	BDES	BGRD	BSUB1	BSUB2	AVAIL
OPNAV N2K2	ASST AGENCY COORD	1000	LT	0075S		9906
OPNAV N6E2F	PROGRAM ANALYSIS	1050	LCDR	0075R		9906
OPNAV N633	HD SURVEILLANCE	1050	CAPT	0075R		9906
OPNAV N631	HD, NAVY SATCOM BR	1050	CAPT	0075P		9906
NAVSOC PT MUGU	CO SHR ACTIVITY	1000	CAPT	0075R		9906
USSPACECOM	CH READINESS DIV	1050	CAPT	0075Q		9907
OPNAV N60G	ASST ELEC WAR	1050	LCDR	0075R		9907
USSPAC CB OPS	CH, INTEL	1630	CAPT	0075S		9907
SPAWAR SPTECH	DPJ SUP/SPACE PJ	1610	CDR	0075P		9909
COMNAVSPACECOM	DIR LOG&INFO SYS DIV	1700	CAPT	0075Q		9910
NAVSOC PT MUGU	XO	1000	CDR	0075S		9911

Billets With Subspecialty Code XX76 (Space Systems - Operations)

ACTIVITY	TITLE	BDES	BGRD	BSUB1	BSUB2	AVAIL
CNSC DET VB	AF EXCHANGE OFF	1000	LCDR	0076P		AVAIL
CNSC DET VB	AF EXCHANGE OFF	1000	LCDR	0076P		AVAIL
NAVSPACECOM	OPINTEL/ASCC	1110	LCDR	0076S		9906
COMNAVSPACE	NSST	1300	CDR	0076S		9906
NAVSPACECOM	OPS INTEL/ASCC	1050	LT	0076S		9906
DEFINTEL AGEN	DEPUTY	1630	CDR	0076S		9906
USSPACECOM	XO 100/02	1000	CAPT	0076S		9906
USSPAC CB OPS	MSL INT OFF	1700	LT	0076S		9906
NSGA SGROVE	CO SHR ACTIVITY	1610	CAPT	0076P		9906
NSGCD POT P F	OIC SHR ACT	1610	CDR	0076S		9907
NSGCD DET POT	CLASSIC WIZ OPS	1610	LT	0076P		9907
NSA/CSS COMSEC	ELXEQ RSCH	1120	LT	0076P		9908
COMNAVSPACECOM	MWPR/PERSONNEL OFF	1700	LCDR	0033P	0076S	9908
SPAWAR SPTECH	SPACE ACQ	1510	LCDR	0076P		9908
COMNAVSPACECOM	MGMT INFO SYS/DEP DIV	1700	CDR	0089Q	0076S	9908
USSPAC CB OPS	CH STAN/EVAL	1050	CDR	0076R		9910
OPNAV N632E	TENCAP ASST AIR WARF	1300	LT	0076P		9912
USSPACECOM	DCINC SATCOM	1050	CDR	0076S		9912
USSPACECOM	SPACE SYS OP	1700	LCDR	0076P		9912
OPNAV N63C	PLN/POL/ENVIR	1050	CAPT	0076R		0001
USSPACECOM	BMD PLNS OFF	1000	LCDR	0076S		0001
NSGA D/RAMROD	CLASSIC WIZ OPS	1610	LCDR	0076P		0001

Billets With Subspecialty Code XX77 (Space Systems - Engineering)

ACTIVITY	TITLE	BDES	BGRD	BSUB1	BSUB2	AVAIL
SPAWAR SPTECH	DEP SPEC SYS MGR	1000	CDR	0077P		9906
PEOSPACOMMSENS	DEP DPJ SUP/TEST&EVAL	1000	LT	0077P		9906
SPAWAR SPTECH	SPACE PJ TECH/SYS ENG	1000	LCDR	0077P		9906
NAVSOC PT MUGU	ELX ENG/SAT SYS	1000	LT	0077S		9906
DISA HQ	SATCOM PLNG	1440	CDR	0077P		9906
NCCOSC RDTE	SPACE ACQ/RSCH	1510	CDR	0077P	0055R	9906
NAWS P M N R A	DEP DPJ MGR/MILSTAR	1000	CAPT	0077P		9907
SPAWAR SPTECH	SPACE ACQ	1300	LT	0077P		9907
SPAWAR SPTECH	SPACE ACQ/COMM ENG	1440	LCDR	0077P		9908
SPAWAR RMOSDGO	APM USER EQUIP T&E	1510	CDR	0077P		9910
NIWA FTMD/CCP	CLASSICW OPS PROJ MG	1610	LCDR	0077P		9910
SPAWAR SPTECH	DEP SPEC SYS SPACE	1510	CDR	0077P		9910
NCCOSC RDTE DV	SPACE ACQ	1440	LCDR	0077P		9911
SPAWAR SPTECH	DPJ SUP/SPEC PROJ	1000	CAPT	0077P		9912
PEOSPACOMMSENS	DEP DPJ MGR	1510	CAPT	0077P		0001
SPAWAR SPTECH	SPACE ACQ/LAUNCH SYS	1700	LT	0077P		0001

ENLISTED BILLETS

AT NAVAL SPACE COMMAND
DAHLGREN, VIRGINIA

Following is the allowance for enlisted personnel at Naval Space Command, Naval Surface Warfare Center Dahlgren Division, Dahlgren, Va. Dahlgren is located approximately 50 minutes from Washington, D.C., and three hours from Norfolk, Va. The base is also home to the Aegis Training & Readiness Center and the Navy's only active gun testing range. You will also find a small Navy Exchange, commissary, gymnasium, auto and wood hobby shops, year-round pool, library, chapel, theater, and numerous outdoor recreation facilities. If you would like more information about one of the Navy's "best kept secret" duty stations, or would like a welcome aboard package, feel free to contact Lt.Cmdr. Jane Hoffman at DSN 249-5152 (email address: jhoffman@ nsc.navy.mil) or the Command Master Chief, ETCM Alan Kinder. Master Chief Kinder can be reached at DSN 249-6115 or commercial (540) 653-6115 (email address: akinder@nsc.navy.mil). If you are interested in receiving orders to Naval Space Command, contact your detailer.

CTA:	E7:1		E5:2	E4:1
CTR:		E6:1	E5:2	
CTT:		E6:2		
DP:			E5:1	
DS:		E6:1	E5:1	
EA:	E7:1			
ET:	E7:1	E6:1	E5:3	E4:2
EW:	E7:1		E5:2	E4:2
IS:	E7:1	E6:2	E5:4	E4:3
NC:	E7:1			
OS:	E7:3	E6:5	E5:3	E4:13
RM:	E7:2	E6:3	E5:8	E4:1
SK:			E5:1	
YN:		E6:1	E5:2*	

*One YN2 billet is TAR.

Work progresses toward defining operational requirements for Mobile User Objective System (MUOS)

Proposals for Future SATCOM System To Be Solicited

By Al Sapp

Naval Space Command hosted a meeting with representatives from the joint community on Jan. 20-21 to determine requirements for the Mobile User Objective System (MUOS).

MUOS is a future satellite communications (SATCOM) system that all services will use for mobile, netted communications on the battlefield.

The Joint Requirements Oversight Council (JROC) designated Navy as the lead service to develop a replacement for the UHF Follow-On (UFO) system. Navy plans to have the replacement or objective system, referred to as MUOS, fielded by 2007.

MUOS will provide greater capability to the warfighter with advanced UHF and other SATCOM technological solutions being explored.

In September 1998, the director of the Navy Space Systems Division tasked Naval Space Command to take the lead in the development of the MUOS Operational Requirements Document (ORD). From the start, Naval Space Command facilitated joint action officer meetings that included representatives from all services, the Joint Staff, key agencies, and various CINCs to include U.S. Space Command.

Over the last few months, the MUOS participants reached joint consensus on the MUOS key performance parameters and other ORD requirements during a series of meetings. The group has maintained steady progress on preparing the ORD.

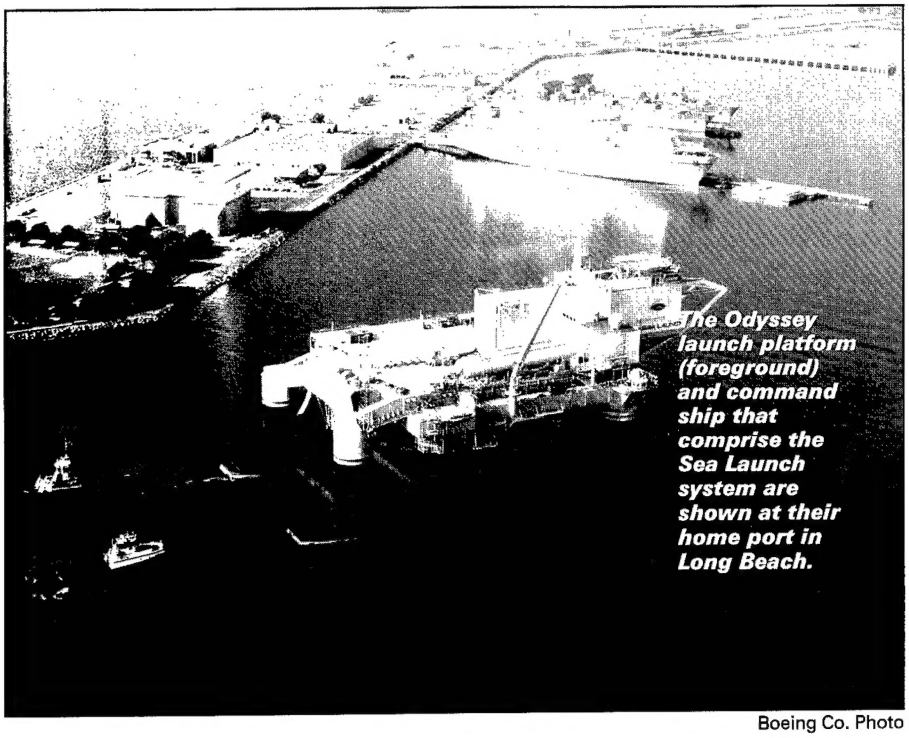
During the last ORD meeting in January, Naval Space Command advocated ways to better define some ORD key performance parameters to include innovative ways to measure warfighter satisfaction of certain requirements, such as data accuracy and voice quality. The attendees adopted all of the NAVSPACECOM proposals.

Naval Space Command's SATCOM Plans and Policies Branch revised the ORD based on this joint consensus and released the document for joint action officer staffing on Feb. 2.

Naval Space Command will continue to work the ORD aggressively with the joint community. In the upcoming months, NAVSPACECOM anticipates a high level of effort on the ORD to support the release of the Request For Proposal (RFP) for concept studies by the Program Executive Office (PEO) Space Communications and Sensors (SCS) (PMW-146) on July 1.

Following the RFP, Naval Space Command will lead an effort to determine how to best incorporate the findings from the concept studies to refine the ORD prior to a JROC in October 2000.

Al Sapp is employed by ARINC and supports Naval Space Command's SATCOM Plans and Policy Branch.



The Odyssey launch platform (foreground) and command ship that comprise the Sea Launch system are shown at their home port in Long Beach.

Boeing Co. Photo

By IS2 Darin Kroft

An international consortium hopes to mark a significant milestone in space technology with a demonstration of their Sea Launch system in March.

Sea Launch represents a new technique for launching satellites from a mobile, floating platform. Positioning the launch platform in international waters eliminates restrictions on launch azimuth often associated with land-based launch and range facilities. By conducting operations from the equator, Sea Launch can take advantage of the rotational forces of the Earth to maximize booster performance.

The first demonstration launch is targeted for mid-March and will carry a simulated satellite to orbit from a launch position in the Pacific Ocean approximately 1,400 miles southeast of Hawaii.

The Sea Launch system includes two separate sea-going vessels. The Odyssey is a self-propelled, semi-submersible launch platform that was converted from a North Sea oil-drilling rig. The second vessel, known as the Sea Launch Commander, serves as a floating mission control center and rocket assembly plant.

Sea Launch's home port is located at Long Beach, Calif. Occupying nearly 17 acres of former U.S. Navy property, the home port provides the facilities, equipment, supplies, and personnel necessary to receive, transport, process, test, and integrate spacecraft and their associated launch vehicles.

Sea Launch's home port features a new payload processing facility that includes two state-of-the-art spacecraft preparation areas and an encapsulation facility.

The Sea Launch partners include Boeing Commercial Space Co. in Seattle, Wash., Kvaerner Maritime of Norway, RSC-Energia of Russia, and KB Yuzhnoye/PO Yuzhmash of Ukraine.

The command ship was designed and built by Kvaerner Maritime, and was outfitted with more than 600 tons of electronic and mechanical support equipment at St. Petersburg, Russia. The first two Sea Launch rockets — modified versions of the Ukranian-built two-stage Zenit booster and a third-stage Block DM supplied by Energia — were loaded on board prior to the command ship's maiden voyage to its Long Beach home port last summer.

The Odyssey also reached home port last summer after sailing from Vyborg, Russia where the 440-foot-long and 220-foot-wide launch platform was fitted with rocket fueling systems, transporter-erector, and automated control systems.

The Sea Launch Commander vessel is 660 feet long and 106 feet wide, and provides 240 launch team members and customers with berthing, dining, recreation, and medical facilities. It houses the mission control center and provides communications with the launch vehicle, spacecraft, and customer facilities during operations.

The Odyssey houses integrated launch vehicles in an environmentally controlled hangar during transit to the launch site. In preparation for launch, the platform is lowered to an approximately 70-foot draft to stabilize the launch pad. A dynamic positioning system, along with other control systems, determines and maintains precise coordinates of the launch pad.

Once in position, the automated transporter-erector lifts the booster into launch position. As the mass of the platform shifts, a sophisticated trim and heel system maintains stability for launch.

Chosen to capitalize on the Earth's rotation, the Sea Launch system offers greater payload lift capacity, lofted perigee, or a combination of the two. Launch will take place at the equator in international waters in the Pacific Ocean about 1,400 miles southeast of Hawaii.

The combination of benign weather and the stability of the submersible platform makes it possible to launch year round.

As a launch vehicle is rolled out of its hangar aboard Odyssey, the Sea Launch command ship moves five kilometers away. The mission control center initiates remote fueling and activates the automated launch sequence.

Monitored by a combination of tracking systems, the Zenit lifts the vehicle through the Earth's atmosphere and the Block DM upper stage then guides the payload to its desired orbital position. At separation, Sea Launch provides the separation state vector to ensure successful satellite acquisition by the customer.

Sea Launch's first mission, under contract with Hughes Space and Communications International, is for the delivery of a Hughes-built HS 702 spacecraft. Designated as Galaxy XI, the satellite will be placed in geostationary orbit to become part of the PanAmSat network that serves customers throughout North America.

Petty Officer 2nd Class Darin Kroft is assigned to Naval Space Command's Intelligence Branch.

Second Global Broadcast Payload Operational Aboard Navy's UHF Follow-On Spacecraft

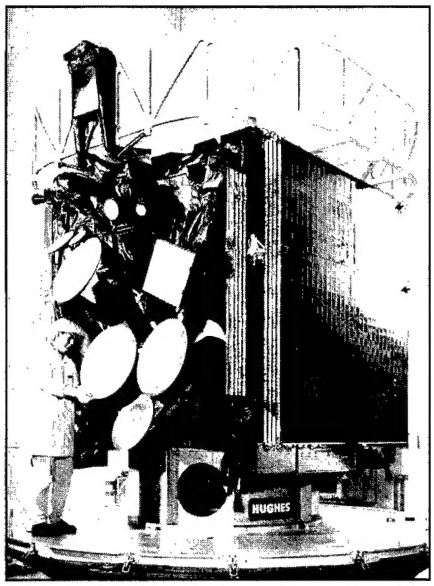
The U.S. Navy's ninth UHF Follow-On communications satellite was successfully launched on Oct. 20.

The spacecraft was boosted into orbit atop an Atlas IIA rocket from Space Launch Complex 36A at Cape Canaveral Air Station, Fla., by Lockheed Martin's International Launch Services and the Air Force's 3rd Space Launch Squadron.

The Block III UHF F9 communications satellite is the ninth of 10 Hughes Space and Communications Company HS-601 models built for the Department of Defense. Satellites eight through 10 are equipped with ultra-high-frequency, extremely-high-frequency, and Global Broadcast Service wideband communications payloads.

The Atlas rocket and Centaur upper stage pushed the Navy's 7,066-pound satellite into an intermediate transfer orbit of 13,966.8 nautical miles apogee, 154.5 nautical miles perigee and an inclination of 27.0 degrees (based on the Centaur guidance system calculations).

The Navy's Program Executive Office for Space, Communications, and Sensors (located in San Diego) contracted with Hughes Space and Communications Co. to build the UHF Follow-On communications satellites in a $1.9 billion program (over 10 launches). Hughes, in turn, contracted with Lockheed Martin Commercial Launch Services for the lift to orbit.



A technician holds one of the steerable spot beam antennas for the GBS payload on the 11-foot-tall F9 Navy communications satellite. Hughes Photo

Naval Space Command assumed operational control of the spacecraft on Jan. 15 following UHF F-9's arrival at its operating geostationary orbit and system check out.

Satellite telemetry and control is conducted by the Air Force's 3rd Satellite Operations Squadron (3SOPS).

The UHF Follow-On communications satellite constellation is utilized to satisfy DoD requirements for UHF, EHF, and GBS communications, providing fleet broadcast to all Navy ships and command and control networks for selected aircraft, ships, and submarines.

Following the launch of UHF F-9 and another launch scheduled for later this year, the UHF Follow-On constellation will consist of eight modified 39-channel Hughes HS-601 satellites and one in-orbit spare.

The UHF Follow-On satellites replace the Fleet Satellite Communications (FLTSATCOM) spacecraft currently supporting the Navy's global communications network, serving ships at sea and a variety of other U.S. military fixed and mobile terminals. They are compatible with ground and sea-based terminals already in service. *Source: Hughes Space and Communications Co.*

Ka-Band Demonstrated On Navy's Newest Communications Satellite

The U.S. Navy put its new Ka-band capabilities to use for the first time in December, demonstrating its Global Broadcast Service (GBS) in a video link with satellite builder Hughes Space and Communications Company.

With the revolutionary GBS payload, the Navy's UHF Follow-On satellites are among the first operational systems, government or commercial, to carry Ka-band.

Hughes completed all in-orbit testing in early December of the UHF, EHF and GBS payloads on UHF F-9, its latest military satellite. UHF F-9 was launched Oct. 20 and entered service in January of this year.

Using one of F-9's Ka-band transponders, Capt. Jim Loiselle, the Navy's UHF Follow-On program manager, broadcast real-time and recorded video from San Diego and thanked Hughes employees who built the satellite. GBS is adapted from Hughes' commercial direct-to-home television technology, to provide high-speed, high-quality, wideband broadcast signals to warfighters in all branches of the military, on land, at sea, and in the air.

UHF F-9 is the second of three UHF satellites that carry the first GBS payloads for the Department of Defense. The three satellites will provide near-worldwide broadband coverage.

The GBS package revolutionizes communications for the full range of the DoD's high-capacity data delivery requirements, from intelligence dissemination to quality-of-life programming.

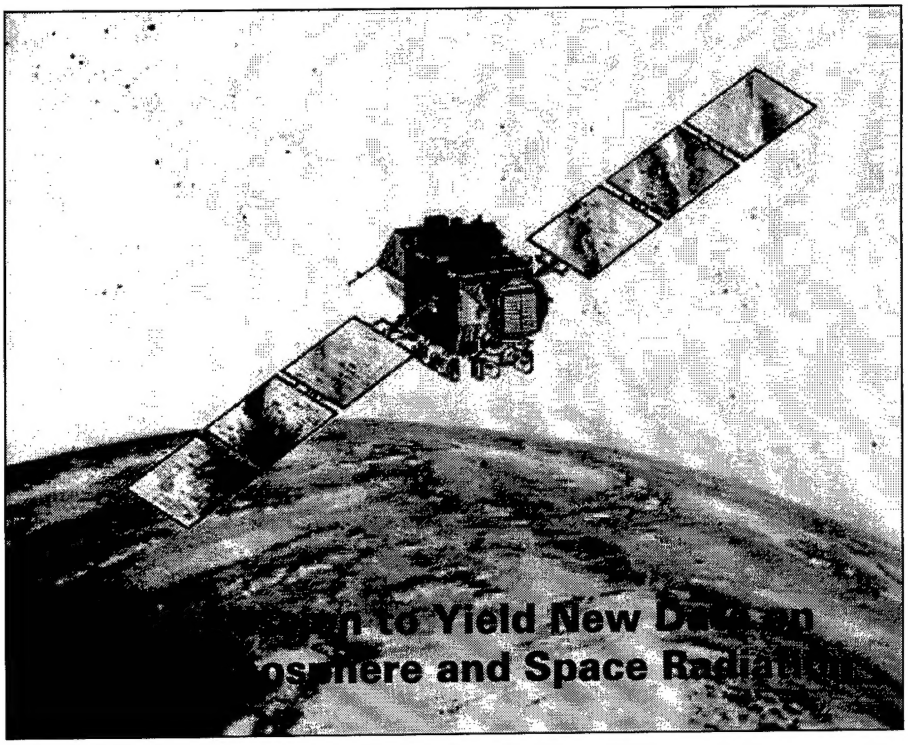
GBS broadcast management centers package, schedule, and deliver the broadcast product. They also respond to user requests from the field. Typical information products include video, mapping, charting and geodesy, imagery, weather, and data.

The GBS payload employs four 130-watt, 24 megabits-per-second military Ka-band transponders operating at 30/20 GHz. The information can be received by small, mobile tactical terminals. UHF F-8, F-9, and F-10 carry the GBS package in addition to the existing UHF and EHF payloads.

Hughes won the initial UHF Follow-On contract in July 1988 for one satellite, with options for nine more, all of which had been exercised by January 1994. An EHF payload was added starting with the fourth satellite.

In March 1996, the Navy ordered the special GBS payloads for F-8, F-9 and F-10, bringing the total contract value to $1.85 billion, including launch services.

The first GBS payload was delivered in orbit only two years after contract signing, making the program a model for streamlined military acquisition procedures. *Source: Hughes Space and Communications Co.*



n to Yield New Data on osphere and Space Radiation

Scientists at the Naval Research Laboratory (NRL) developed a suite of ultraviolet (UV) and X-ray remote sensing instruments, a dual-frequency radio beacon for computerized ionospheric tomography, and a superconductivity experiment launched on board the Air Force Space Test Program's (STP's) Advanced Research and Global Observation Satellite (ARGOS) on Feb. 23.

Observational data from the UV and X-ray instruments, together with the radio measurements of total electron content, will be used to study "space weather," the ever-changing effects of the sun's radiation on the upper atmosphere and ionosphere. Scientists will be able to create the first dynamic global maps of the ionosphere, showing chemical, density, and temperature changes.

A number of other objectives will also be addressed, including mapping of ultraviolet stars, timing of X-ray pulsars and the application of these measurements to satellite navigation and timing, space tests of new superconducting electronic devices, and space tests of radiation-resistant and fault-tolerant computers.

ARGOS, which has a three-year planned operational life, was launched from Vandenberg Air Force Base, Calif., by a Delta II booster into a polar orbit. The spacecraft carries nine primary experiments that contain 31 different sensors and subexperiments. Of the primary experiments, three were developed by NRL's Space Science Division (SSD), one was developed by the laboratory's Naval Center for Space Technology (NCST), and one was developed by NRL's Plasma Physics Division. Two others were developed with NRL collaboration.

The three SSD experiments are the High Resolution Airglow/Aurora Spectroscopy (HIRAAS), the Global Imaging Monitor of the Ionosphere (GIMI), and the Unconventional Stellar Aspect (USA) experiments.

HIRAAS is a multi-instrument experiment that will scan the edge of the Earth's atmosphere (called the limb) about every 90 seconds to measure naturally-occurring airglow emissions in the 50 to 340 nanometer (nm) wavelength range over a wide array of geophysical conditions and at varying local times.

Data from the HIRAAS experiment will be used to explore new concepts in monitoring space weather from satellites, and to improve high-frequency communications and over-the-horizon radar, which rely on propagation through the atmosphere. The measurements will also help researchers assess the long-term effects of the increases of atmospheric greenhouse gases on the upper atmosphere and ionosphere.

GIMI will obtain wide-field ultraviolet images of ionospheric and upper atmospheric emissions simultaneously, covering large areas of the Earth from a low-Earth orbit. These images will be used to determine chemical densities on a global basis and to detect disturbances in the ionosphere that are caused by auroral activity, gravity waves and foreign materials from meteors, suspected "ice comets," rocket exhausts and chemical releases.

USA will observe bright X-ray sources, mostly binary X-ray sources in our Galaxy, to test new approaches to satellite navigation. The sensors, built in collaboration with the Stanford Linear Accelerator Center, are sensitive to X-ray wavelengths of about 1 to 10 Angstroms and will measure celestial sources and characterize them for potential use as reference points for autonomous military space systems. It will make measurements aimed at furthering scientific understanding of the physical nature of the sources. USA will also perform the first X-ray tomographic survey of the earth's atmosphere.

The Coherent Electromagnetic Radio Tomography (CERTO) instrumentation, developed by NRL's Plasma Physics Division, consists of a stable radio beacon transmitter on the satellite and a chain of receivers on the ground. Radio transmissions from the CERTO beacon are processed by the ground receivers to produce two-dimensional maps of the electron densities in the ionosphere. The CERTO measurement technique provides images of the ionosphere with 10 km vertical and horizontal resolution. In addition, ionospheric irregularities of 1 km or less in size can be determined by fluctuations in the CERTO radio waves.

NRL NCST is responsible for the High Temperature Superconducting in Space Experiment II (HTSSE II), which will demonstrate the operational space capability of superconducting components and technology that are lightweight, faster, and use much less power than the silicon or gallium arsenide (GaAs) based electronics used today. *Source: Naval Research Laboratory.*

Spotlight on NAVSOC's Detachment ALFA

Maine Tracking Site Provides Satellite Control, Support for Navy Communications Platforms

By Lt.Cmdr. David H. Atchison

Hidden in the picturesque fishing village of Prospect Harbor, Maine, is the Naval Satellite Operations Center (NAVSOC) Detachment ALFA. This modest eight-acre station boasts one of the most striking views of the Atlantic Ocean imaginable, complete with a still-functioning 1850's lighthouse and overlooking a harbor dotted with lobster buoys.

Here, Detachment ALFA's 18-member military and civilian crew operates and maintains a satellite telemetry, tracking, and command (TT&C) facility for the Navy.

The detachment's primary missions encompass a wide range of satellite operations. Det ALFA provides 24-hour TT&C operations for extremely-high-frequency (EHF) communications packages on the Ultra-High-Frequency (UHF) Follow-On (UFO) satellites in conjunction with Operations Center Squadron 31 at Schreiver Air Force Base, Colo.

Det ALFA also performs on-orbit health and welfare S-band telemetry monitoring for Fleet Satellite Communications System (FLTSAT) and UFO spacecraft, and operates one of two TT&C ground stations for the FLTSAT EHF Package (FEP) satellites.

In addition, the detachment also operates the Navy's Terminal Data Node (NTDN) that distributes ephemeris data to all Department of Defense EHF satellite communications terminals.

Secondary missions include supporting Department of the Navy EHF satellite communications platforms, performing power balancing calibration (signal to noise ratio) or performing fault isolation on their SATCOM suites.

Personnel manning the FEP Operations Center (FEPOC) monitor an individual platform's C2 and C3 messages, determine the platform's transmitted signal strength reaching the satellite, and whether or not the satellite responds.

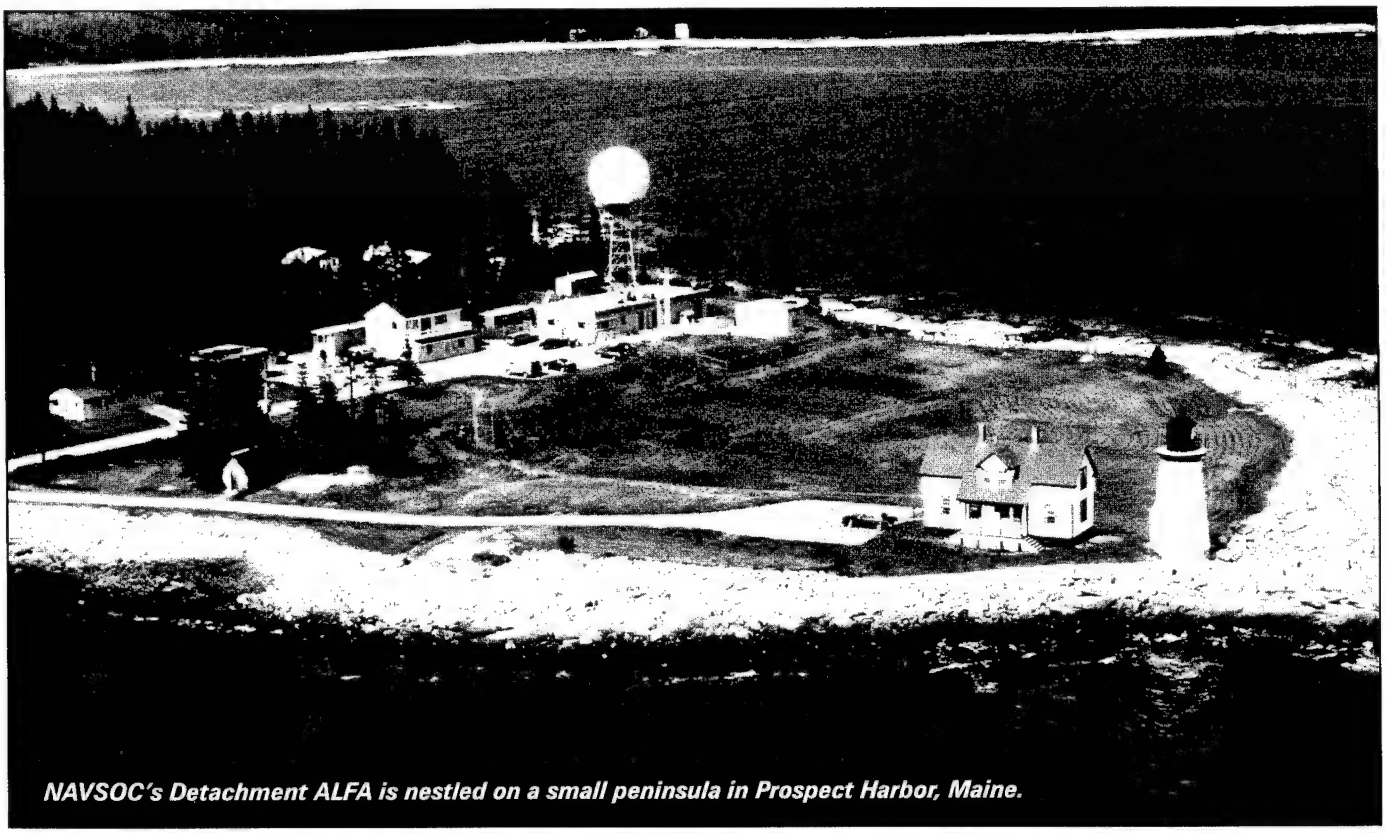
Detachment ALFA has saved hundreds of man-hours in the Fleet, and on several occasions prevented shipboard technicians from disassembling their communications suites to search for non-existent problems. Flawed adaptation data loads have even been identified this way.

Detachment ALFA's tertiary missions include providing 24-hour emergency dispatch service for the local volunteer fire department.

Recently, Det ALFA has taken on the additional responsibilities of primary TT&C site for the new POLAR EHF satellite, and as primary TT&C site for the GEOSAT Follow On (GFO) in conjunction with NAVSOC headquarters in Point Mugu, Calif.

Det ALFA's scope of responsibility will continue to grow in the future as these two systems become fully operational and additional satellites are added to their respective constellations.

Lt.Cmdr. David Atchison serves as officer in charge of Detachment ALFA.



NAVSOC's Detachment ALFA is nestled on a small peninsula in Prospect Harbor, Maine.

Satellite Communications Course Sponsored by NAVSPACECOM

Naval Space Command will host a three-day course on naval satellite communications on May 18-20. The course will be offered at Dahlgren, Va.

The course is targeted toward Fleet and Fleet Marine Force operations officers, communicators, and C4I planners at the E7 level and above who wish to expand their knowledge of naval satellite communications capabilities, requirements, and proposed future architectures.

The course will include introductions to UHF, SHF, EHF, and commercial satellite communications, JCS Instruction 6250.01, and information warfare. Tours of Naval Space Command's operations center will also be made available.

Classified portions of the course will be presented at the secret level. For registration information, contact Ms. Sandy Bone at (540) 653-6130, DSN 249-6130, FAX (540) 653-6108, or email to bone@nsc.navy.mil.

Due to the highly mobile nature of naval operations, satellite communication is absolutely critical to successful mission accomplishment. Likewise, as technology continues to advance, the requirements placed on our military satellite communications systems will expand at an exponential rate.

Capabilities not even thought of 10 years ago — video teleconferencing, video telemedicine, Internet, World Wide Web — are rapidly becoming core warfighting capabilities. Without satellite communications, naval forces will not be able to capitalize on these ever-advancing technologies. The goal of Naval Space Command's SATCOM course is to provide Fleet operators with the most up-to-date information on this important aspect of naval warfighting.

NAVAL POSTGRADUATE SCHOOL HIGHLIGHT

USSPACECOM Hosts Graduate Students

Recently, a group of 36 faculty and students from Naval Postgraduate School (NPS) visited U.S. Space Command at Peterson Air Force Base in Colorado Springs, Colo., as part of an information exchange program. The group was treated to a first-class tour of facilities at Shriever Air Force Base, Army Space Command (Forward), Cheyenne Mountain Air Force Base, and USSPACECOM's headquarters.

Students were afforded the opportunity to see satellite operations and control theory put into practice at 1 SOPS (Satellite Operations Squadron), 2 SOPS, and 22 SOPS. They were able to see firsthand the amount of effort required to maintain satellites in orbit on a daily basis.

Space surveillance and control was explained and demonstrated during the group's tour of Cheyenne Mountain AFB. In addition to gaining an appreciation for U.S. Space Command's mission to track and catalog several thousand objects in space, the group heard the history of "the mountain" and the enormous task undertaken to build the underground facility.

Army Space Command (Forward) showed just how close the services are to achieving a sensor-to-shooter delivery system utilizing space assets.

NPS student officers presented briefs on research projects involving high-speed radiation hard chip design and fabrication. Additionally, members from the Naval Postgraduate School's senior space operations class briefed J3 and J5 staff from U.S. Space Command on their vision of a future Integrated Intelligence Overhead Architecture.

The briefing was the culmination of work performed by the students during a two-course sequence in 1998. During the first phase, NPS students developed a future requirements database formulated around current and projected requirements for the year 2020.

Two teams were formed for the second phase, which was devoted to the preliminary design of a notional overhead architecture that will meet the requirements. During the design phase, the students incorporated a combination of current and future technologies.

The teams next presented their requirements and designs to representatives from the National Reconnaissance Office, Naval Space Command, and various space industry professionals.

"Exchanging knowledge between academics and operators strengthens both groups," asserts Craig Baldwin, serving as the Naval Space Systems Academic Chair at the postgraduate school.

"NPS faculty and students were enriched by this interchange," he adds. "The students will be moving back into the Fleet and Fleet Marine Forces with a better sense of where and how space force enhancement fits into current operations.

"Combined with their in-depth knowledge of satellite design and operations, they will become the leaders in space tactical development and acquisition programs," says Baldwin.

NEWS **BRIEFS**

Navy's Hall Thruster Electric Propulsion System Goes Operational

The Naval Research Laboratory (NRL) successfully operated the Electric Propulsion Demonstration Module (EPDM). Calibration firings for the system, installed aboard an experimental spacecraft owned by the National Reconnaissance Office, were initiated in October. This marked the first time that the United States has used a Hall thruster electric propulsion system in space.

The EPDM Hall thruster system provides for orbit raising as well as long-term station keeping for the NRO spacecraft. This flight will provide the evaluation for use on future spacecraft missions.

The EPDM system utilizes a specific type of Hall thruster, the Thruster with Anode Layer (TAL). The TAL is an electrostatic type of electric propulsion thruster that uses Xenon gas as the propellant. The EPDM system has a fuel efficiency of 1,500 seconds of Specific Impulse (Isp), which is approximately five times greater than a conventional chemical propulsion system.

The Hall thruster operates on about 600 watts of power and produces about 40 milliNewtons of thrust. Hall thrusters, developed in the former Soviet Union, are similar to the Ion engines developed in the United States in that they both produce thrust through electrostatic acceleration of an ionized propellant. However, unlike an Ion engine, the Hall thruster is a "gridless" device that produces over two times the thrust for the same operating power when compared to an Ion engine.

The EPDM program is run by the Naval Center for Space Technology at NRL. NRL led the design, development, and testing of all EPDM subsystems and integrated the module into the NRO spacecraft.

The Ballistic Missile Defense Office, in conjunction with NASA's Lewis Research Center, has sponsored the development of the TAL thruster and power processing unit. *Source: Naval Research Laboratory*

Information Technology Improving Sailors' Lives

By JO1 Chris Alves

Chief of Naval Operations Adm. Jay L. Johnson told a conference of communication and electronics experts recently that Navy investments in information technology have already paid off for Sailors.

"Simply ask Sailors who have been on ships with IT-21 (Information Technology 21st Century) capabilities. They will tell you of its dramatic impact on their quality of life," the CNO said, referring to the project designed to improve warfighting capability, reduce Fleet operating and support costs, and enhance the quality of life of deployed Sailors and Marines. "It has been a major boost to morale and efficiency on long deployments."

Forward-deployed Sailors enjoy the benefits of IT-21 in a variety of ways. For example, aboard USS *Enterprise* during a recent deployment, crew members sent about 60,000 e-mail messages per day.

Some USS *Carl Vinson* Sailors and officers are taking graduate-level college courses using video teleconferencing and the Internet while the ship is at sea.

In addition to improving the quality of Sailors' lives, the CNO said advances in information technology will make Sailors more effective in their mission, despite a Fleet with fewer ships than in the Cold War era.

"We have spread sustained combat power across the Fleet as never before, and the future holds the promise of even greater fleet effectiveness," Adm. Johnson said. He added, "We can't just focus on IT-21 and forget" other priorities, such as Fleet modernization and improving quality of life for Sailors.

"We've got to balance it all. We're making progress, and the trends are in the right direction."

The CNO told those attending the conference that the Navy must continue to keep pace with technology as the Fleet moves forward toward "network-centric" warfare using IT-21 technology.

"Looking forward I see a Navy of enhanced effectiveness, greater efficiency, and tremendous reach, yet it will remain a Navy forward-deployed in the requisite numbers to strengthen peace, deepen friendships, and deter aggression," the CNO said. *Source: Navy News Service*

Navy Satellite Measures Record Ozone Hole

The Naval Research Laboratory (NRL) reports that measurements from its space-based Polar Ozone and Aerosol Measurement (POAM III) instrument indicate that polar stratospheric clouds over Antarctica last winter were unusually extensive compared to earlier years. Navy researchers believe that this increase in the extent of PSCs over the 1998 winter season set the stage for the near-record size (in terms of area coverage) of the Antarctic ozone hole this year reported by NASA and NOAA.

PSCs form in the wintertime polar stratosphere, high above the region where more familiar tropospheric clouds form. They are known to be a crucial ingredient in the chemical destruction of ozone that occurs in the Antarctic ozone hole.

POAM's orbit takes it over Antarctica 14 times each day, and from Aug. 5 through Sept. 6 last year, every POAM III measurement indicated a PSC — the longest continuous stretch of 100 percent cloudiness ever observed by the POAM instruments.

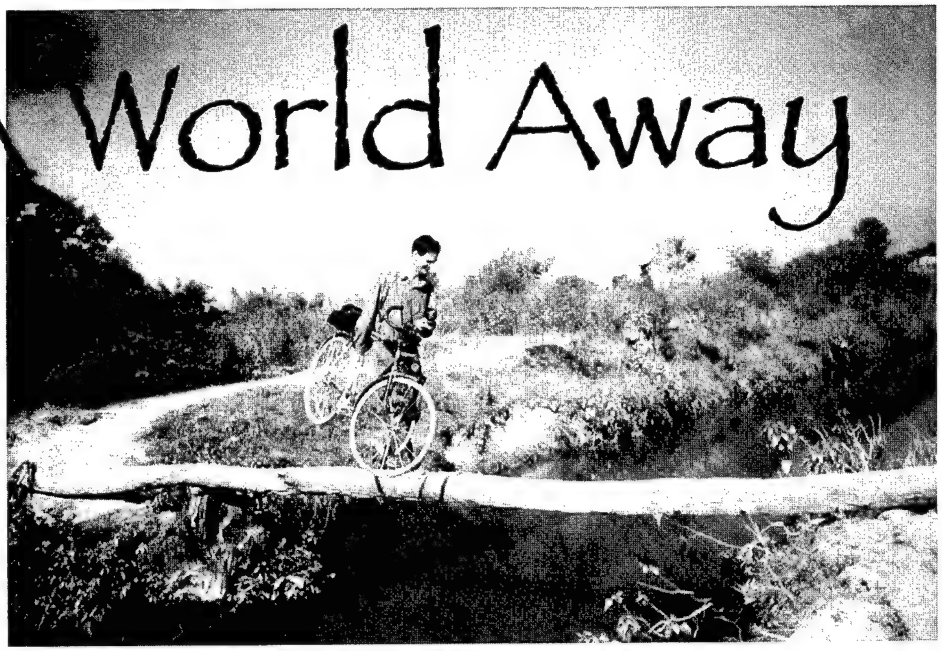
The POAM III measurements also show a pronounced decrease in stratospheric water vapor coincident with the development of the PSCs. This phenomenon is thought to be important in the formation of the Antarctic ozone hole.

Supported by the Office of Naval Research and the DoD Space Test Program, POAM III is currently the only operational satellite instrument providing continuous coverage of the vertical distribution of ozone with good resolution (1 km), and of PSCs in the polar stratosphere. *Source: Naval Research Laboratory*

Half A World Away

Living for two years as a Peace Corps volunteer in Nepal gave this Naval Space Command physicist a new appreciation for "primitive" culture

By Gary R. Wagner



A bicycle was about the only means of transportation available to McCollum in the remote regions of Nepal where he lived and worked, and a bridge over a stream might simply be a log to walk across.

Opting to turn his hobby of studying foreign cultures into a life experience, Charlie McCollum resigned his job as a physicist at Naval Space Command and signed up with the Peace Corps to live and work outside the United States. His Peace Corps assignment, which began in 1995, took him to Nepal, one of the poorest countries in the world, located just north of India and home to Mt. Everest.

McCollum, who rented out his Dahlgren residence during his two years abroad, returned to the United States and was re-hired at Naval Space Command last year.

While living half a world away from home, feeling at times like he "was on a different planet," McCollum nevertheless calls his Peace Corps work "the best experience of my life."

The Peace Corps was established by President John F. Kennedy in 1962 to train volunteers for extended assignments in third-world countries. They work on a wide range of projects - water sanitation, forestry, fisheries, education, health, soil conservation, youth development, agriculture, community development - to benefit the host nation.

Volunteers are screened to determine their qualifications and then travel to their assigned country where they complete an intensive three-month training program to learn the language and culture of that nation. The Peace Corps continues to provide limited support to volunteers in the field through correspondence, semi-annual training seminars, and emergency evacuation if necessary.

While in their assignments, volunteers earn a salary that is as close to the local indigenous salary as possible, without jeopardizing their health. McCollum earned just $1,500 a year - more than the average $200 a year income for Nepal, but enough to cover his additional expenses for phone calls, mail, and travel.

The Peace Corps gave McCollum a choice of four regions — Inter America, Africa, eastern Europe, or Asia Pacific. He selected Asia Pacific.

"They looked at my skills and the needs of the candidate countries in that region and determined that the best match would be for me to be a teacher trainer in Nepal," McCollum said. "Since I had a bachelor's degree in physics, I met the qualifications to train secondary math teachers."

McCollum's three months of training in the Nepali cities of Kathmandu and Potihara prepared him to teach in very remote areas of country. "I needed to learn the language so that I could teach using the language. I needed to learn as much of the culture as possible so I would not offend the locals," he explained.

"I had to learn how to be my own doctor so that when I got sick, I could diagnose and treat my condition. And I needed to be trained in teaching methodology, so that I could train teachers."

According to McCollum, about half of all primary teachers in Nepal have only 10 years of education, the other half have about 12 years. For secondary teachers, the statistics are somewhat better.

His training complete, McCollum was sent to a remote place in the far western part of Nepal. There was no electricity, running water, or paved road. There was only one battery-operated telephone in a village of 3,000 people. He was the only foreigner there and from then on had to communicate in Nepali.

"I was to teach math to children in grades 4 through 8 for one full school year. This was to give me teaching experience so that I would be prepared for the

Nepalese Culture

- Principal religion is Hindu; cows are worshipped as a goddess.
- Caste social structure; the word for "you" differs depending on caste, age, and occupation of the person you're addressing.
- Public affection between members of opposite sex is unacceptable.
- Men do not wear shorts; women must wear dresses to their ankles.
- Boys and girls are kept separate; no dating is allowed, marriages are arranged.

Showing the Nepalese how to make a more efficient cookstove (top right photo) was one of McCollum's "spare time" projects when he wasn't teaching math or English (bottom right photo).

second year when I would train secondary teachers," McCollum explained.

He taught math and English in a school of 1,200 students and 24 teachers. He had about 60 students in each of his classes. The children sat crowded on long benches and long desks — boys on one side of the class and girls on the other side.

The classrooms were dirt floored with the only source of light being the sunlight coming through paneless windows. "Our teaching materials were limited to chalk, paper, markers, sticks, rocks, dirt, leaves, and anything else found in the jungle," McCollum related.

He lived with a Nepalese family and had his own room. He used an oil lamp to read by in the evenings and slept on a hard wooden bed with no mattress. Water was drawn from a well about 30 meters from the house using a hand pump. The bathroom was an "outhouse" about 50 meters from the house.

The climate at lower elevations in Nepal is tropical, marked by hot summers and relatively mild winters. There were no air conditioners or heaters. During his second year there, he moved to the eastern part of Nepal and further up into the mountains, where the winters were a bit colder.

"During the winter, I would bathe once or twice a week because the well water was cold and the air was cold," McCollum said. "The locals were smarter. They would bathe about once a month."

When he wasn't teaching, he would work on secondary projects such as building improved smokeless cooking stoves. "The traditional stove in a Nepalese home is basically an open fire. While they're cooking, the entire house fills up with smoke.

"The stove I taught them to build cooked more efficiently, and had a chimney to get the smoke out of the house," McCollum explained. The stove had to be made with locally available materials from the jungle — clay, cow manure, chaff, rocks — because the people could not afford to buy materials. The clay, cow manure, and chaff were mixed with water to create a strong "cement" mixture that would hold the rocks or bricks together.

"The Nepalese asked me if we had this type of stove in America," he quipped.

During his spare time, he helped with various other projects, such as teaching conversational English and helping build a local community house.

Some of the primitive living conditions took their toll on McCollum. "Sanitation is not very good there and I had diarrhea about once a month," he recalls. Even so, he returned to the U.S. with a genuine appreciation of the Nepalese lifestyle.

"Life is more peaceful without noisy, smelly cars, lawnmowers, leaf blowers, motorcycles, and other machines," reflects McCollum. "There is not much worry about weight problems because everybody has to walk alot to get from one place to another, and because the diet consists of natural foods that are low in fat and sugars such as rice, beans, and vegetables."

McCollum enjoyed studying the culture and geography, and eating new exotic foods including mangos, papayas, guavas, bananas, jackfruit, custard apples, and many fruits that he had never seen before that were abundant in the tropical climate.

"The monsoon season was sort of a drag, though," he admits. "Sometimes it was impossible to ride my bike in the foot of mud on the dirt roads."

The most challenging aspect of his life in Nepal was his teaching assignment. "I struggled with the crowded classrooms, the lack of good teaching materials, and my very limited Nepali vocabulary of 100 or so words," McCollum said. "But, everyday I focused on learning from my mistakes and continued to improve."

And he found a sense of humor to be invaluable in coping with difficult circumstances. "I remember a time when I was riding on a very crowded bus, yet the driver kept stopping, and more people kept getting on the bus," recalls McCollum.

"We squeezed in like sardines. I couldn't move. Still the driver would continue to pick up more people. Then one farmer started cramming his goats and chickens into the bus with the passengers.

"Somehow, he got all 20 or so goats in. It was hilarious."

All in all, McCollum's world view has been significantly altered following his Peace Corps work. "In some respects, I think civilization has advanced too rapidly and carelessly. The side effects are often more harmful than the benefits."

CDO Qualified ... *FSSC Empowers Junior Sailors*

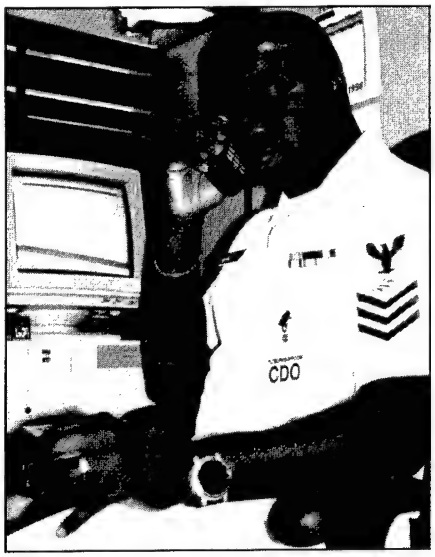
By JO2 Kaye Trammell

In today's new Navy, things are changing. This young Navy is full of smart ships and fewer but brighter Sailors, all coming together to provide for national security and defense. While Fleet Surveillance Support Command (FSSC) may seem like it's not at the top of the Navy's list for empowering junior Sailors, they've taken matters into their own hands and joined the rest of the Fleet.

In the past, FSSC operated a standard Navy quarterdeck complete with a junior Sailor as Petty Officer of the Watch (POOW) to answer the phone and greet visitors. The POOWs would stand their watches and were responsible for opening the building in the morning and securing it at night, all under the watchful eye of a Command Duty Officer (CDO), typically qualified first class petty officers and chiefs.

The Senior Watchbill Coordinator noticed something just wasn't right about this system and the future of the Navy.

Chief Storekeeper Dennis Reddy took his idea straight to the top and started making changes. Under Reddy's new watchbill plan, motivated second class petty officers could get qualified to stand watch as a CDO. This improves the rotation on the CDO watchbill, eliminates the unnecessary POOW, and gives FSSC second class petty officers a chance to prove their merit.



RM1 Vernell Horton believes junior Sailors are ready for the responsibilities of the CDO watch. Above, he ensures the cellular is working properly before securing the FSSC building for the day.

The change has proven to be a win-win situation from the Sailors' perspective to that of the Navy.

According to Radioman 1st Class Todd Traffanstedt, a previously qualified CDO, the second class petty officers at FSSC are up to this challenge.

"The majority of (second class petty officers) here are from the Fleet," began Traffanstedt. "They can handle this responsibility."

Traffanstedt also sat on the new CDO board and was able to question the hopeful second class petty officers on how to react in certain situations.

"The big thing that I hit on," said Traffanstedt, "was message traffic. It's important for a CDO to know how to act on certain things that come across message traffic. If you don't know what an incident report is, how can you know what to do?"

Operations Specialist 2nd Class Joseph Lacky and his fellow second class petty officers are grateful to see this change in course. According to Lackey, this empowerment based on merit and not chevrons is something he's been waiting for.

"The 'old Navy' mentality views the E-5 as less reliable," said Lackey. "But with the Navy going to these smart ship programs, things are changing. Smaller bases and commands are using their people better and holding each person more accountable for their workload."

According to Lackey, giving responsibilities to more Sailors was just what was needed to drive the Navy into the 21st century.

"Everyone is doing the whole job together," said Lackey. "And because of that, there's a higher team standard."

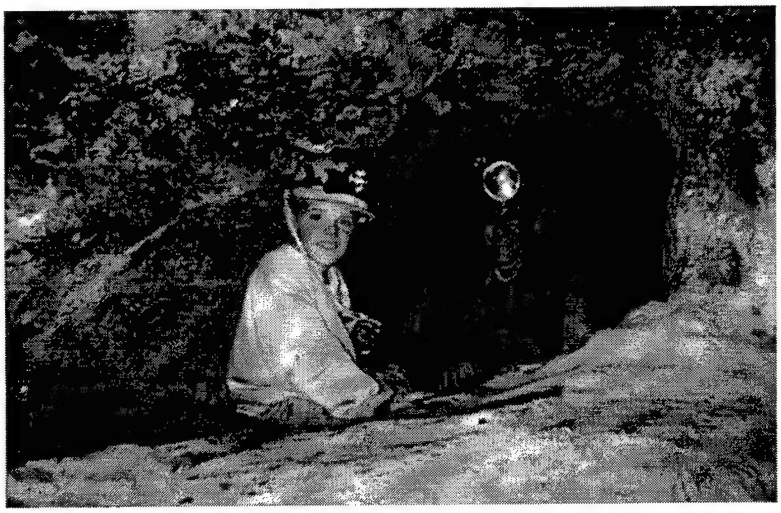
Lackey and most of his shipmates at FSSC believe this higher standard will take the Navy a long way.

JO2 Kaye Trammell is the public affairs officer for Fleet Surveillance Support Command in Chesapeake, Va.

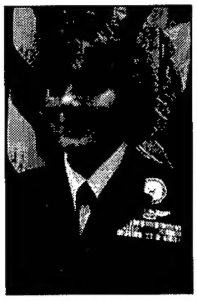
Teaching Core Values

Lessons From A Cave

Lt. Michael Scott, assistant operations officer for Fleet Surveillance Support Command, accompanied his son's Boy Scout troop on a recent caving expedition. In one of Lt. Scott's photos from the trip, a Scout and a professional cave guide pause in a tunnel. Lt. Scott has been actively involved in scouting from the time his son joined as a Tiger Scout. According to Lt. Scott, it's a natural extension of his work to volunteer with the Scouts. "The Navy starts you out with a good base in honor, courage, and commitment. The Boy Scouts start out by instilling core values from day one." For Lt. Scott, helping teach his son and other Scouts core values is like "being a light in a pitch-dark cave."




IS1 Taylor


YN1 Beres


JO2 Trammell


RM2 Gatlin


CTR2 Munro

People of the Year

Top Sailors and Junior Sailors Honored

IS1 Charles J. Taylor, Jr.
Headquarters Sailor of Year & Shore Sailor of the Year

Taylor's award recognizes his performance as the leading petty officer in Naval Space Command's Intelligence Branch. As an intelligence specialist, he is responsible for developing and presenting briefings to ensure the command and Naval Space Operations Center watch teams are well informed on key theater and tactical issues.

His efforts to support watchstanders and briefers during exercise Ulchi Focus Lens 98 in Korea and Operation Desert Fox in Iraq in the closing months of last year also earned him the title of Sailor of the Quarter for October through December.

Taylor competed with Sailor of the Year nominees from NAVSPACECOM detachments and component commands to garner Shore Sailor of the Year honors, and is now in competition for Naval District Washington Shore Sailor of the Year.

Originally from Lake Charles, La., Taylor joined the Navy in 1989. In his Navy career he has served with the Naval Support Activity's security department in Naples, Italy, and aboard the aircraft carrier USS *America*. He reported to Naval Space Command in July 1996, where he currently serves as command master-at-arms and physical training coordinator for his branch.

During his off-duty hours, Taylor serves as a Tiger Cubs den coordinator and T-ball coach.

YN1 Mary R. Beres
Sea Sailor of the Year

As the leading petty officer for the command's Joint Tactical Ground Station (JTAGS) Detachment Echo in Chesapeake, Va., Beres provides consistent leadership to the Sailors who constantly rotate on deployments for fleet support.

Beres calls Richmond, Va., her hometown. She enlisted in 1981 as an airman apprentice. After serving with the Navy's Blue Angels flight demonstration squadron, she changed her rate to yeoman. Subsequent tours were with Naval Striking and Support Forces, Southern Europe, in Naples, Italy, and the Service School Command at Naval Training Center, Great Lakes, Ill.

After an assignment with the Counseling and Assistance Center at Naval Station Roosevelt Roads, Puerto Rico, she joined the Naval Space Surveillance Center at Dahlgren in 1992. When NAVSPASUR consolidated with Naval Space Command, Beres became the leading petty officer for the Management Support Division. She transferred to Det Echo in 1996.

While at NAVSPACECOM, Beres earned her Enlisted Aviation Warfare Specialist designation, and was named as Sailor of the Year for 1995.

In her off-duty time, Beres cares for her five children, and has also coordinated monthly command visits to the Hampton Veterans Administration Medical Center in Hampton, Va. Beres and her troops take time out of their day to pay tribute and visit the hospitalized veterans as an effort to continue supporting them.

JO2 Kathleen D. Trammell
Junior Shore Sailor of the Year

A journalist assigned to Fleet Surveillance Support Command headquarters at Chesapeake, Va., Trammell serves as the command's public affairs officer. She is responsible for editing and publishing the command's newsletter and writing press releases and articles.

She also designs and updates Fleet Surveillance Support Command's web page, and helps coordinate various public outreach programs and military ceremonies for the command.

Her off-duty involvement in the community has included volunteer work at a local public broadcasting television and radio station.

Originally from Oshkosh, Wis., Trammell enlisted in 1996. After she completed Journalist "A" School, she was assigned to USS *John F. Kennedy* as a food service assistant in the ship's wardroom. She also worked as a staff photojournalist for the ship's newspaper, conducting interviews, taking photos, and writing and editing articles on her off-duty time. She reported to Fleet Surveillance Support Command in 1997.

RM2 Theresa M. Gatlin
Junior Sea Sailor of the Year

Currently assigned to Naval Satellite Operations Center's Detachment Charlie in Guam, Gatlin serves as a duty satellite manager and as the facility's supply officer. As duty satellite manager, she has improved the detachment's emergency response proce-

*(Please see **Sailors** on page 18)*

Sailors

(Continued from page 17)

dures, and as the supply petty officer, she overhauled the station's supply system to improve service.

Gatlin enlisted in 1994 and initially specialized as a data processing technician. Following Data Processing "A" School, she served on board USS *Puget Sound* and USS *Holland* prior to transferring to NAVSOC's Detachment Charlie in 1996. After arriving at Guam, Gatlin was advanced to petty officer second class and converted to the radioman rating.

Originally from San Diego, Calif., Gatlin has spent her off-duty hours helping to develop a prototype web site for the detachment, and has volunteered to assist with local and military roadside, beach, and reef clean-up projects.

CTR2 Lisa A. Munro
NAVSPACE Headquarters
Junior Sailor of the Year

A cryptologic technician, Munro currently serves as leading petty officer in the command's Naval Space Operations Center. In addition to providing administrative support for four watch sections, she is one of only three enlisted members to qualify as a space surveillance officer.

She is recognized as a subject matter expert concerning geolocation of radio frequency interference and singlehandedly manages a laser clearing house database to ensure the safety of satellites during Earth-based laser testing.

Originally from Denver, Colo., Munro enlisted in 1990. Her subsequent Navy assignments have been with the National Security Agency in Ft. Meade, Md., the Naval Computer and Telecommunications Station at Diego Garcia in the Indian Ocean, and with the Personnel Exchange Program in Gander, Newfoundland. She reported to Dahlgren in 1997.

"Bravo Zulu"

Ship signal flags for the letters "B" (bravo) and "Z" (zulu), when hoisted together, mean "well done."

B. J. Andersen

Francis Cage

Eric Newsome

People of the Year

Civilians of the Year Recognized

Bobbi J. Andersen
Civilian of the Year

Andersen is a mail and files assistant in the Management Support Division. Her award citation lauds her work in processing over 41,000 pieces of mail and nearly 4,000 faxes as "diligent and meticulous." Over the past year, she has assisted with other division responsibilities, serving as a point of contact for processing training and travel vouchers and reviewing and processing civilian payroll data.

Originally from King George, Andersen first joined Naval Space Command in 1985. Among her other awards and recognition, she was named Civilian of the Quarter for the command for October through December 1997.

Francis S. Cage
Ops Watchstander of the Year

As a sensor data analyst in the command's Naval Space Operations Center, Cage monitors and processes space event information.

His award recognizes his effort during the past year in assisting senior analysts in building space object orbits using only data from the Naval Space Surveillance System, effectively reducing the number of uncorrelated orbits.

In another incident, he provided critical information to U.S. Space Command to correct the misidentification of an object associated with a multiple-payload launch. That effort earned him an additional honor as ADP Operations Watchstander of the Quarter for October through December.

A resident of Hollywood, Md., Cage joined Naval Space Command as a computer specialist in November 1995.

Eric W. Newsome
ADP Watchstander of the Year

Newsome's award recognizes his efforts as a sensor data analyst to ensure the availability of NAVSPACECOM's computer systems for mission processing. During 1998, he resolved approximately 250 trouble calls received during his shift. He detected over 20 mission system malfunctions and initiated successful restarts to keep each event's down time to less than two minutes.

Earlier last year, Newsome was also cited as ADP Watchstander of the Quarter for April through June for his quick response in troubleshooting data circuit problems.

Civilian Length of Service Awards

20 Years

M. Gail Workman
Carmond Robbins
Lisa Harris

15 Years

Judy Berry
Sue Ellen Kling

10 Years

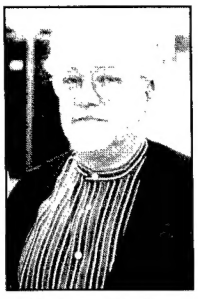
Francis S. Cage
Rebecca Burleson
Mavis Jackson
Edward Lydick
Nancy Mullen
Teresa Watkins
Charlie McCollum
Jennifer Myers
Theresa Brown

IS1 Taylor

CTO2 Dickinson

Susan Wright

Francis Cage



Robert Taylor

Quarterly Awards Presented

Civilian and military personnel at Naval Space Command were recently selected for quarterly awards for October through December 1998.

Petty Officer 1st Class Charles J. Taylor, Jr. is Sailor of the Quarter. His award recognizes his performance as the leading petty officer in Naval Space Command's Intelligence Branch. As an intelligence specialist, he is responsible for developing and presenting briefings to ensure the command and Naval Space Operations Center watch teams are well informed on key theater and tactical issues. During the past quarter, his support to watchstanders and briefers during exercise Ulchi Focus Lens 98 and Operation Desert Fox was crucial.

Petty Officer 2nd Class Keith Dickinson is Junior Sailor of the Quarter. A cryptologic technician, he was cited for his work as a watch supervisor in the command's Joint Information Processing Center. He is recognized by his supervisors for his technical expertise and his skills as a trainer. His support of exercise Global Guardian, in particular, earned him a commendation from Commander Naval Space Command.

Susan P. Wright is Civilian of the Quarter. She was commended for her performance as a mail and file clerk at Naval Space Command headquarters. In a three-month period, she personally processed over 10,000 pieces of mail and 900 faxes, and bar-coded over 500 classified documents. She is also responsible for maintaining the command's master file of all correspondence to and from the command.

Francis S. Cage is the Operations Watchstander of the Quarter. As a sensor data analyst in the command's Naval Space Operations Center, his award recognizes his efforts in a particular incident to provide critical information to U.S. Space Command to correct the misidentification of an object associated with a multiple-payload launch.

Robert E. Taylor is ADP Watchstander of the Quarter. He was cited for his work in troubleshooting error conditions that occurred with software and hardware components of the command's mission system on two separate occasions. In both instances, his response and the corrective measures he instituted helped minimize system down time. Taylor is a computer operator in the command's Operations and Maintenance Branch.

Decorated Service

Meritorious Service Medal

Lt.Cmdr. Bruce Reese ... for service as the meterological and oceanographic officer for Naval Space Command from May 1995 to February 1999.

Navy & Marine Corps Commendation Medals

Lt.Cmdr. Lawrence A. Pemberton ... for service as command and control program manager and flag aide at Naval Space Command from October 1995 to January 1999.

Lt.Cmdr. Martin Beaulieu ... for service as assistant strike operations officer in USS *Carl Vinson* (CVN 70) from March 1996 to September 1998.

Lt. Jacqueline Butler ... for service as project manager responsible for the mission processing system and 50 other command and control information systems at Naval Space Command from April 1996 to February 1999.

Navy & Marine Corps Achievement Medals

EW2 Erice Laursen ... for service as electronic warfare technician in USS *Barry* (DDG 52) from December 1993 to July 1998.

EW2 Jeremy Crow ... for service as electronic warfare technician in USS *Ticonderoga* (CG 47) from May 1994 to December 1998.

OS2 Nathan Williams ... for service as track supervisor and Joint Maritime Command Information Systems operator in USS *Clark* (FFG 11) from January 1996 to December 1998.

U.S. Navy Expert Pistol Medal

YN2 Joseph Parent

Good Conduct Medals

CTO3 Tania Jones (1st)
OS2 Yvonne Ferrell (2nd)
IS2 Darin Kroft (2nd)
IS2 Gary Barile (2nd)
CTO2 D'Juan Moss (2nd)
OS2 Joseph Wilson (2nd)
CTO2 James Carter (2nd)
OS3 Jeri Bloch (2nd)
CTA2 Tina Callis (3rd)
ET2 David Grawl (3rd)
CTO2 Jennifer Rinehart (3rd)
RM2 Tanji Johnson (4th)
RMC Bobby Lowery (5th)
IS1 Diane Tucker (5th)

CALENDAR

Meetings & Symposia

Sea-Air-Space Systems & Technology Exposition, March 30-April 1, Washington, D.C. Sponsored by the Navy League. Call (703) 528-1775.

Spring Intelligence Symposium, April 21-22, Langley, Va. Sponsored by AFCEA. Call (703) 631-6250.

Global Air & Space Business Forum & Exposition, May 3-5, Arlington, Va. Sponsored by the American Institute of Aeronautics and Astronautics. Call (703) 264-7500.

GovTechNet International 99, June 15-17, Washington, D.C. Sponsored by AFCEA. Call (703) 631-6130.

Courses & Seminars

Following courses sponsored by the Applied Technology Institute. Call (410) 531-6034; email atiinfo@aol.com. Course outlines are available on the Internet at http://catalog.com/hitekweb/.

- SATCOM Systems Engineering, March 22-24, Los Angeles, Calif.
- Ground Station Design, March 25-26, Los Angeles, Calif.
- Digital Satellite Communications Systems, April 5-8, Beltsville, Md.
- Satellite Communications, Tracking & Control, april 20-22, College Park, Md.
- Managing Satellite Constellation Development, April 27-29, College Park, Md.
- Satellite Industry Update: Present Status & Future Trends, June 7, College Park, Md.
- Small Remote Sensing Satellites, June 14-16, College Park, Md.

Following courses sponsored by the AFCEA Professional Development Center. Call (800) 336-4583, ext. 6135 or (703) 631-6135 or visit Web page http://www.afcea.org.

- Command, Control, and Communications, April 12-16, Fairfax, Va. (classified Secret).
- Military Satellite Communications, April 19-23, Fairfax, Va. (classified Secret).
- Principles of Communications with Applications in Military Systems, April 26-30, Fairfax, Va.
- Global Command and Control System, May 3-7, Fairfax, Va. (classified Secret).
- The U.S. Intelligence Community: Who Does What, With What, For What?, May 18-20, Fairfax, Va. (classified Secret).

DEPARTMENT OF THE NAVY

Naval Space Command
5280 Fourth St.
Dahlgren, VA 22448-5300

THIRD-CLASS BULK RATE
POSTAGE & FEES PAID
DEPARTMENT OF THE NAVY
PERMIT No. 25

Do Not Forward
Address Correction Requested

Official Business